



COURSE INFORMATION SHEET

Course Title	NATIONAL TRAINING COURSE ON REACTOR ENGINEERING (NTC-RE)
Date and Duration	14–25 October 2024 (10 training days)
Course Description	This course is organized and offered by the Philippine Nuclear Research Institute in cooperation with the Japan Atomic Energy Agency, University of the Philippines–Manila, Technological University of the Philippines–Taguig, and Mapúa University. This course will prepare participants in understanding advanced theoretical concepts presented in higher-level reactor engineering courses and is in line with PNRI's human resource development program.
Course Goals and Objectives	<p>The goal of this course is to provide participants with a foundation for understanding the scientific principles that are associated with various nuclear reactor facilities. This basic knowledge on the numerous scientific and engineering disciplines involved in operating a nuclear reactor will help the participants more fully understand the basis of the safe and effective utilization of nuclear energy.</p> <p>At the end of this course, participants are expected to:</p> <ol style="list-style-type: none"> 1. gain basic knowledge on ionizing radiation and describe its interaction with matter; 2. describe the mechanisms for detection of and protection against ionizing radiation; 3. gain basic understanding of nuclear physics and reactor theory; 4. be familiar with the design and functional considerations of existing reactor technologies in the world; 5. understand reactor operation aspect of reactor theory and physical mechanisms involved in reactor control; 6. become acquainted with the processes involved in the lifetime of nuclear fuel resources; 7. learn the structure and design of nuclear fuel; 8. gain basic understanding of nuclear reactor thermal hydraulics, and reactor thermal system; 9. become oriented with nuclear reactor safety, nuclear safety regulations, and safety culture; 10. gain practical insight on theoretical concepts through facility visits and performance of experiments and exercises.
Participation	This course is open to university professors, lecturers, trainers, and other professionals on reactor engineering topics. Applications will undergo evaluation, and slots are limited to 25 participants only.
Pre-requisite	As a foundational course, modest background on the following topics is assumed: Newtonian mechanics, Thermodynamics, Material Science, Algebra, Differential and Integral Calculus, Ordinary and Partial Differential Equations, and Modern Physics.





Application Procedure	<p>Candidates wishing to apply for this course should follow the steps below:</p> <ol style="list-style-type: none"> 1. Prepare electronic copies of the following supporting documents: <ul style="list-style-type: none"> • Recommendation/Endorsement letter from the university, institution, or company where the applicant is employed. If unemployed, please provide a letter of intent. For graduate students, please provide a recommendation letter from research supervisor/adviser. • Medical Certificate • Duly accomplished Nominee Conforme Form. • Recent 1x1 ID photo of the applicant 2. Access the DOST-PNRI Online Course Application Portal (https://services.pnri.dost.gov.ph/portal/ApplyUser). Fill out application form completely and submit. Any issues or queries related to the Application Portal can be addressed to mis@pnri.dost.gov.ph. 3. Closing date for applications is 16 September 2024 (Monday) <p>Training capacity is limited to 25 participants only. Successful applicants will be notified by email 3–5 working days after the closing date. For more details on how to apply: https://bit.ly/PNRI-Course-Application.</p>
Nature and Scope of the Course	<p>This course will be conducted in an onsite/face-to-face format. It will run for two (2) weeks. Each lecture or practical session is designed for 1.5–4 hours engagement with the course topics.</p> <p>Activities used for instruction and assessment of learning include the following: interactive lectures, exercises, hands-on activities, and group presentations. In the last week of the course, a presentation of any selected topics covered in this course will be done per group. This activity generally aims to evaluate the understanding of each participant of the topics discussed based on the their respective lectures.</p> <p>This is a Pass/Fail course. Participants need to accomplish the following to receive a certificate of completion:</p> <ol style="list-style-type: none"> a. earned a final grade of at least 50% b. participated in the group presentation c. rendered at least 70% training hours in the course





Administrative Arrangements	Participation to the course is free of charge. However, the participants should cover all expenses necessary to participate in the course (e.g., computer, Internet connection, accommodation, travel expenses, food expenses, etc.). In addition, the organizers do not provide the participants with any auxiliary devices (e.g., CD, USB flash drive, etc.). It is understood that each organization, in recommending/endorsing the participants, undertakes the responsibility for such coverage including any special arrangements related to the participant's work schedule/load for the duration of the training course. It is recommended that participants residing outside Metro Manila ensure accommodation preferably nearby PNRI.
Topics to be Covered	<ol style="list-style-type: none"> 1. Applications of research reactors 2. Atomic and nuclear physics 3. Fundamentals of nuclear energy 4. Interaction of radiation with matter 5. Nuclear fuel cycle 6. Nuclear fuel engineering 7. Nuclear reactor calculation 8. Nuclear reactor thermal hydraulics 9. Nuclear safety 10. Overview of nuclear reactors and reactor technology 11. Radiation detection and measurement 12. Radiation physics 13. Radiation shielding 14. Radiation protection 15. Reactivity control of nuclear reactors 16. Reactor kinetics 17. Reactor physics 18. Research reactor simulator 19. Regulatory infrastructure for nuclear power plants 20. Thermal engineering
Activities/ Exercises/ Experiments	<ol style="list-style-type: none"> 1. Calculation exercise on elementary solution for diffusion equation on simplified systems 2. Experiments with neutron source: neutron flux measurement, neutron moderation, and neutron activation 3. Radiation detection and measurement: time–distance–shielding principle 4. Research reactor simulator: approach to criticality experiment, control rod worth calibration 5. Experiments / exercises with a subcritical assembly 6. Tour of PNRI facilities
For Inquiries	Contact the Nuclear Training Center at (02) 8929-6011 up to 19 local 236 or send an email to nsd.nros@pnri.dost.gov.ph .

